Not to be cited without
permission of the authors[1]

Ne pas citer sans
autorisation des auteurs[1]

Canadian Atlantic Fisheries
Scientific Advisory Committee

CAFSAC Research Document 90/21

Comité scientifique consultatif des
pêches canadiennes dans l'Atlantique

CSCPCA Document de recherche 90/21

Summary of Catch Statistics by Sub-area and Assessment Unit for the Northern Labrador Arctic Charr and Atlantic Salmon Fisheries in 1989

by

J. B. Dempson and M. Shears
Science Branch
Department of Fisheries and Oceans
P. O. Box 5667
St. John's, Newfoundland A1C 5X1

[1] This series documents the scientific basis for fisheries management advice in Atlantic Canada. As such, it addresses the issues of the day in the time frames required and the Research Documents it contains are not intended as definitive statements on the subjects addressed but rather as progress reports on ongoing investigations.

Research Documents are produced in the official language in which they are provided to the Secretariat by the author.

[1] Cette série documente les bases scientifiques des conseils de gestion des pêches sur la côte atlantique du Canada. Comme telle, elle couvre les problèmes actuels selon les échéanciers voulus et les Documents de recherche qu'elle contient ne doivent pas être considérés comme des énoncés finals sur les sujets traités mais plutôt comme des rapports d'étape sur les études en cours.

Les Documents de recherche sont publiés dans la langue officielle utilisée par les auteurs dans le manuscrit envoyé au secrétariat.

Abstract

Catch and effort statistics for the northern Labrador Arctic charr fishery in 1989 are summarized. Total northern Labrador charr landings of 100 t were 12% higher than 1988 landings but still 41% below the previous 10-year mean of 169 t. This marked the first time since 1981 that charr landings increased over the previous year. Within the Nain Fishing Region, however, effort declined by 7% from 1988 but catch per unit effort was the highest since 1982. An experimental river fishery for Arctic charr successfully harvested about one tonne of fish during the first week of September from five rivers located in the Voisey and Nain stock unit areas. Aerial surveys indicated high concentrations of charr in several rivers. Atlantic salmon landings at Nain are summarized for the period 1977 to 1989. Landings of salmon at Nain in 1989 totaled 30 t, 49% higher than in 1988 and were the highest since 1982.

Résumé

On présente un sommaire des statistiques sur les prises et l'effort de pêche de l'omble chevalier dans le nord du Labrador en 1989. Les débarquements totaux pour cette région, soit 100 t, sont en hausse de 12 % sur ceux de 1988, mais demeurent inférieurs de 41 % à la moyenne des dix dernières années (169 t). C'est la première fois depuis 1981 que les débarquements d'omble chevalier augmentent d'une année sur l'autre. Dans la zone de pêche de la baie Nain, l'effort a diminué de 7 % depuis 1988, mais les prises par unité d'effort étaient les plus élevées depuis 1982. Une pêche expérimentale de l'omble chevalier dans cinq rivières des unités d'évaluation de la baie Nain et de la baie Voisey a fourni une tonne de poisson durant la première semaine de septembre. Des observations aériennes ont révélé la présence de grandes concentrations d'omble chevalier dans plusieurs rivières. Par ailleurs, on présente aussi un sommaire des débarquements de saumon de l'Atlantique dans la baie Nain de 1977 à 1989. Ces débarquements ont atteint 30 t en 1989, ce qui représente un record depuis 1982 et une augmentation de 49 % par rapport à 1988.

Introduction

Continuous records of commercial landings of anadromous Arctic charr (Salvelinus alpinus) from the northern Labrador coast are available since 1944. Catch statistics from the Nain and Makkovik Fishing Regions, and from subareas within the Nain Fishing Region (Fig. 1) exist since 1974. From 1977 to 1982 more than 200 $t \cdot y^{-1}$ of Arctic charr were caught in northern Labrador but during the last five years (1985-89) annual landings have averaged only 110 t. The highest landings on record were 252 t in 1981, while the lowest during the past 30 years were 54 t in 1975. The expansion of the fishery to more northern areas in 1981 and 1982 resulted in increased catches and, in general, a higher catch per unit of effort. Since then, however, there has been a significant decline in fishing effort and, correspondingly, in commercial landings. Catch levels of the early 1980's were not expected to be achieved in recent years without a substantial increase in the effort directed towards the charr fishery, and a resumption of the fishery into the northern fiord subareas.

This paper summarizes catch statistic information for the 1989 northern Labrador Arctic charr fishery and updates previous reports (summarized in Dempson and Shears 1989) which have examined landings in the commercial fishery. The fishery in the Nain Region also is targeted, to an extent, on Atlantic salmon (Salmo salar). Thus, updated catch information on salmon landings are also provided.

Methods

Information on the commercial landings of Arctic charr and Atlantic salmon in northern Labrador was obtained through purchase slips prepared by Fisheries Statistics and Systems Branch of the Department of Fisheries and Oceans and processed by Salmon and Charr Section of the Freshwater and Anadromous Fish Division. Purchase slips were issued to buyers and were filled out at the time of catch receipt. Information requested included the name of the fisherman, license number, area where fish were caught, date, weight of fish landed, and total number of fish caught. Landed catches were converted to round weight (in kilograms) using the conversion factor: gutted head-on weight x 1.22 = round weight (Dempson 1984). Catch per unit of effort estimates were derived following the method initiated by Coady and Best (1976) and are expressed in terms of kilograms per person-week fished.

Results and Discussion

Total northern Labrador Arctic charr landings

Figure 2 illustrates the commercial landings of Arctic charr from 1944 to 1989. Also shown are the landings from the Nain and Makkovik Fishing Regions since 1974. During the past 16 years, the Nain Region has contributed about 85% of the total northern Labrador catch of Arctic charr averaging 138 $t \cdot y^{-1}$. Landings from both regions in 1989 totaled 100 t; an increase of 12% over 1988 but still 41% below the previous 10-year average (169 t, 1979-88) (Table 1). This marked the first time since 1981 that landings increased over the previous

year. Individually, landings in the Nain Fishing Region of 85 t were 15% higher than in 1988 but 41% below the previous 10-year mean (143 t, 1979-88), while effort declined again by 7% over the previous year. The highest landings in the Nain Region occurred in 1981 (231 t), of which 30% came from the northern fiord subareas of Hebron and Saglek. Since then, catch has declined by 63% with a decrease in effort of 52%. The number of licensed fishermen fishing in the Nain Region has fallen from a high of 142 in 1979 to 63 in 1988. This increased to 72 during 1989.

Charr landings from the Makkovik Region in 1989 were similar to 1988 and totaled 15 t. The highest landings in the Makkovik Region of 39 t occurred in 1982.

Catch and effort data - Nain Fishing Region assessment unit summary

Appendix 1 provides an updated summary of catch and effort statistics for all subareas within the Nain Fishing Region from 1974 to 1989. These subareas form component parts of larger assessment or stock units. Landings of Arctic charr in the Nain assessment unit during 1989 represented 61% of the overall catch from the Nain Fishing Region, while the Voisey unit and Okak unit contributed 13% and 20% respectively.

Tables 2, 3, and 4 summarize catch and effort data for the Voisey, Nain and Okak assessment units, respectively, from 1974 to 1989 while Figure 3 illustrates the trend in catch and TAC over time. With respect to the Voisey assessment unit, the highest catches occurred during the late 1970's as did the highest catch per unit of effort (CUE) (Fig. 4). Landings in 1989 were 11 t, a decrease of 22% from 1988. Effort, however, decreased by 38% with CUE up 27% to the highest value recorded since 1979. Approximately 65% of the TAC was taken in 1989 even though effort was the lowest recorded.

Landings from the Nain assessment unit totaled 51 t; 9.5% higher than the TAC for the entire unit and 34% higher than the catch in 1988. This was the highest catch from the Nain unit since 1982 when 55.6 t were landed. Effort, however, declined by 20% while CUE increased by 68% to the highest recorded for the unit (Fig. 4).

Landings from the Okak assessment unit totaled 17 t, 53% of the TAC for the unit, and were essentially the same as in 1988. Effort increased by 20% resulting in a corresponding decrease in CUE to the lowest value recorded for this unit. While there has been a decreasing trend in CUE of charr in this unit in recent years (Fig. 4), there are indications that a considerable amount of the fishery has been directed towards Atlantic salmon, particularly since 1985.

The 1989 Nain Region commercial charr fishery showed an increase in both catch and CUE over the previous year for the first time since 1981. This was in spite of a decrease, again, in the number of person-weeks fished. With the exception of the Okak assessment unit, there were indications of a higher abundance of charr available in 1989. Aerial observations of several rivers, conducted during the first week of September, also suggested high abundances of charr in certain rivers; however, no data are available for comparison with previous years.

Experimental river fishery

An experimental in-river harvest for Arctic charr was carried out from September 4-7, 1989, in five rivers located in the Voisey and Nain unit stock areas. This project was funded by the Newfoundland Inshore Fisheries Development Association (NIFDA) as one phase of a broader program to try and improve the quality and efficiency of the northern Labrador Arctic charr fishery. Other participants in the project were: Department of Fisheries and Oceans, Provincial Department of Fisheries, Newfoundland and Labrador Institute of Fisheries and Marine Technology, Memorial University, Labrador Inuit Development Corporation, and the Nain Fishermen's Committee.

This project enabled an aerial survey to be carried out over five rivers during a period of time when most adult charr would have been back in freshwater. This survey provided the first opportunity in a number of years to examine qualitatively the relative abundance of Arctic charr in various rivers in the northern Labrador area. For 1989, the objective was to catch approximately one tonne of charr with the catch partitioned over several rivers.

Tables 5 and 6 summarize the information on the river harvest of Arctic charr. One river in Voisey bay was fished as well as the Fraser River in Nain Bay, Kingurutik and Kamanatsuk rivers in Tikkoatokak Bay, and Webb Brook in Webb's Bay. A total of 975 charr were caught of which 827 (~1133 kg) were subsequently transported to the fish plant at Nain. This represents about 1.6% of the total number or 1.3% of the total weight of charr caught in both the commercial and river fisheries in 1989.

In Ikadlivik Brook, Voisey Bay, three large concentrations of charr estimated to be in the thousands were spotted within a 3 to 4 km stretch of brook approximately 20 km upstream from Voisey Bay. Using 101 mm (4") gill nets, five sweeps of a pool caught 113 charr, 98 of which were shipped back to Nain with the others tagged and released. In Webb Brook, two concentrations of charr estimated each to number in the hundreds were spotted; one approximately 10 km upstream from the mouth and the other about 17 km upriver. In two sweeps of the lower pool, 102 charr were caught.

The Kingurutik River is the largest river in Tikkoatokak Bay and empties into Kingurutik Lake before flowing into the sea. Large concentrations of charr estimated to be in the thousands were spotted along a 5 to 10 km stretch of river beginning about 4 km upstream from the lake. In two sweeps using two nets, 400 charr were captured of which 300 were kept for shipment to Nain. In Kamanatsuk Brook, Tikkoatokak Bay, several small concentrations of several hundred charr were observed within a 3 to 4 km stretch of brook starting about 1 km upstream from the mouth. In two sweeps, 40 charr were caught. Finally, in the Fraser River, Nain Bay, large concentrations estimated to be in the thousands were spotted within a 5 km stretch of river just upstream from Tasisuak Lake. In five sweeps 320 charr were caught; 287 subsequently shipped to the fish plant for processing.

The aerial surveys generally indicated large abundances of charr, particularly in several rivers. It should be noted that the entire length of any river was not necessarily surveyed and many charr could still have been in

several of the large lakes that characterize several of these river systems. An earlier trip into Ikadlivik Brook, Voisey Bay, also indicated several small concentrations of charr 10-15 km upstream from the ocean as early as the 15th. of July, 1989.

As pointed out in previous years, the northern Labrador charr fishery will likely need a substantial increase in effort in conjunction with an expansion of the fishery into northern areas in order to attain catch levels recorded in the early 1980's. The experimental river fishery showed that charr can be readily caught in rivers later in the season with the quality of the fish comparable to sea caught charr. While the use of a helicopter is undoubtedly not the way to conduct a cost effective fishery, its use did enable surveys on parts of the rivers to be carried out including qualitative estimates of the relative abundances of charr.

Nain Region - Atlantic salmon landings

Atlantic salmon landings specifically from the Nain Fishing Region are presented for the first time for the period 1977 to 1989. With a few exceptions, salmon caught in this region are not from 'local' rivers; that is, rivers located within the Nain Fishing Region (Antons area and north along the Labrador coast). Reddin and Dempson (1986) reported that many salmon caught in this area likely originated in rivers in central and southern Labrador. For the period 1977 to 1983, 6824 salmon were sampled at Nain. Seventy-four percent or more of either 1-sea-winter (1SW), multi-sea-winter (MSW), or previous spawners had rivers ages 4 years or older, while 45 to 57% had river ages 5 years or older. Tagging information also showed that some of the salmon had origins in insular Newfoundland, Ungava Bay, southern Quebec, the Maritime Provinces, and Maine, U.S.A.

Appendix 2 summarizes the salmon landings by individual subareas within the Nain fishing Region. The majority of the salmon (mean of 91%, 1977-89) that are caught in this region are taken in the offshore islands of the Nain stock unit (ie. Dog Island and Black Island subareas), the Cutthroat subarea (outside of Okak Bay), or at Kiglapaits (Fig. 1). Landings have ranged from a low of 14 t in 1987 to 60 t in 1980 (Table 7, Fig. 5). In 1989, approximately 30 t of salmon were caught in the Nain Region. This was 49% higher than in 1988 and 76% greater than the average salmon catch during the previous five years (17 t, 1984-88). The Cutthroat subarea is the single most important area for salmon fishing with an average of 52% of the salmon caught in this area during the past 13 years. With the declining catch of charr at Cutthroat since 1984-85, more of the fishery may have been directed towards salmon. From 1977 to 1984, 42% of the salmon caught in the Nain Region were landed at Cutthroat. During the past 5 years (1985-89) this has now increased to 67%.

References

Coady, L. W., and C. W. Best. 1976. Biological and management investigations of the Arctic char fishery at Nain, Labrador. Fish. Mar. Serv. Tech. Rep. 624. 103 p.

Dempson, J. B. 1984. Conversion factors for northern Labrador Arctic charr landings statistics. CAFSAC Res. Doc. 84/6. 8. 9.

Dempson, J. B., and M. Shears. 1989. Summary of catch statistics by subarea and assessment unit for the northern Labrador Arctic charr fishery in 1988. CAFSAC Res. Doc. 89/35. 20 p.

Reddin, D.G., and J. B. Dempson. 1986. Origin of Atlantic salmon (Salmo salar L.) caught at sea near Nain, Labrador. Naturaliste can. (Rev. Ecol. Syst.), 113: 211-218.

Table 1. Summary of northern Labrador Arctic charr landings (kg round) by fishing region, 1974-89.

	Nain Fishing Region				Makkovik Fishing Region			
Year	Catch	No. of fishermen	Fathoms of gear licensed	Catch as % of total	Catch	No. of fishermen	Fathoms of gear licensed	Total catch
1974	120,414	66		81	28,133			148,547
1975	44,118	85		82	9,542			53,660
1976	134,898	101		90	15,645			150,543
1977	186,165	128		88	24,205			210,370
1978	213,915	131	21,340	86	34,387	149	29,300	248,302
1979	175,263	142	21,320	82	37,693	110	21,225	212,956
1980	167,991	128	23,960	83	35,561	154	30,635	203,552
1981	231,221	122	21,700	92	20,733	154	30,990	251,954
1982	203,012	118	23,600	84	39,163	141	28,200	242,175
1983	149,732	119	24,400	84	29,100	148	29,600	178,832
1984	123,045	115	23,000	83	24,792	147	29,400	147,837
1985	107,120	95	19,000	76	33,945[1]	132	26,400	141,065
1986	99,963	79	15,800	88	13,888	109	21,800	113,851
1987	97,379	72	14,400	91	9,965	130	26,000	107,344
1988	74,010	63	12,600	83	14,819	120	24,000	88,829
1989	84,837	72	14,400	85	14,808	126	25,200	99,645

[1]Includes 6,788 from spring fishery in Postville area.

Table 2. Catch and effort statistics for the Voisey assessment units from 1974 to 1988. Quota area catch (QAC) refers to the landings from those subareas specifically under TAC regulation only, prior to the derivation of assessment units in 1985.

Year	TAC[1]	QAC	Catch	Effort	CUE	% Offshore	Unit as % of Nain Region Total
1974			29180			31	24
1975			3727			94	8
1976			14652	57	257	21	11
1977			24108	75	321	9	13
1978			36991	102	363	11	17
1979	22500	21880	40590	116	350	47	23
1980	22500	11557	19694	82	240	42	12
1981	16100	16325	23810	90	265	33	10
1982	16100	2688	13309	60	222	45	7
1983	16100	2953	25593	80	320	89	17
1984	16100	8133	20873	101	207	62	17
1985	23400		15648	57	275	91	15
1986	23400		16655	82	203	82	17
1987	17000		21242	101	210	41	22
1988	17000		14037	52	270	60	19
1989	17000		11019	32	344	100	13

[1]TAC applied only to Voisey Bay subarea from 1979 to 1984.

Table 3. Catch and effort statistics for the Nain assessment unit from 1974 to 1988. Quota area catch (QAC) refers to the landings from those subareas specifically under TAC regulation only, prior to the derivation of assessment units in 1986.

Year	TAC[1]	QAC	Catch	Effort	CUE	% Offshore	Unit as % of Nain Region Total
1974			37745			18	31
1975			33830			8	77
1976			53313	196	272	5	40
1977			76255	291	262	7	41
1978			73763	314	235	4	34
1979	61000	52832	66844	336	199	18	38
1980	61000	50176	75055	390	192	30	45
1981	37160	37223	65632	278	236	24	28
1982	43660	39119	55617	235	237	22	27
1983	51000	19102	51202	289	177	34	34
1984	43200	29063	38900	244	159	37	32
1985	30500	36019	41158	252	163	48	38
1986	43000		37095	185	201	56	37
1987	47000		45872	200	229	61	47
1988	47000		38295	229	167	62	52
1989	47000		51465	183	281	41	61

[1]TAC applied only to Anaktalik Bay and Tikkoatokak Bay from 1979 to 1983 (1983 also includes 5 t for Nain Bay) but includes an offshore component from 1984 to 1985.

Table 4. Catch and effort statistics for the Okak assessment unit from 1974 to 1989. Quota area catch (QAC) refers to the landings from those subareas specifically under TAC regulation only, prior to the derivation of assessment units in 1986.

Year	TAC	QAC	Catch	Effort	CUE	% Offshore	Unit as % of Nain Region Total
1974			46891			27	39
1975			5057			53	11
1976			25338	148	171	30	19
1977			42392	243	174	37	23
1978			76024	352	216	54	36
1979			43261	283	153	41	25
1980			49035	253	194	66	29
1981	27300	11049	47541	202	235	78	21
1982	27300	9031	34171	186	184	75	17
1983	21000	30732	48978	286	171	39	33
1984	27000	13864	18146	94	193	25	15
1985	27000	24746	33261	208	160	26	31
1986	42000		28896	172	168	30	29
1987	43000		19649	134	147	20	20
1988	31000		17450	136	128	28	24
1989	31000		16563	163	102	10	20

Table 5. Numbers of fish collected in the experimental river fishery at Nain, Labrador in September, 1989.

	RIVERS					
	Ikadlivik Brook	Webb Brook	Kingurutik River	Kamanatsuk Brook	Fraser River	Total
No. Fish Caught	113	102	400	40	320	975
No. slaughtered	98	102	300	40	287	827
No. tagged & released	15	0	59	0	0	74
No. released	0	0	41	0	33	74
No. Male Slaughtered (%)	34(35%)	38(37%)	106(35%)	11(28%)	93(33%)	282(34%)
No. immature males	8	1	20	0	51	80
No. mature males	26	36	85	11	42	200
No. ripe males	0	0	0	0	0	0
No. Females slaughtered (%)	64(65%)	64(63%)	194(65%)	29(72%)	193(67%)	545(66%)
No. immature females	4	2	11	0	15	32
No. of mature females	60	62	181	29	178	510
No. ripe females	0	0	0	0	0	0
Total Whole/Bled Weight (kg)	169	146	415	58	345	1133
No. Fish slaughtered, but no sex and maturity data	0	1	3	0	0	4

Table 6. Biological data collected in the experimental river fishery at Nain, Labrador in September, 1989.

	RIVERS					
	Ikadlivik Brook	Webb Brook	Kingurutik River	Kamanatsuk Brook	Fraser River	All Total
Mean Fork Length (cm)	51.1	47.6	47.6	47.6	45.4	47.2
Mean Whole/Bled Weight (kg)	1.73	1.45	1.38	1.44	1.21	1.44
Mean Gutted Weight (kg)	1.45	1.19	1.16	1.18	1.02	1.20
Mean Gonad Weight (g)	257.2	219.4	148.6	182.9	102.5	180.9
Mean Age (yr)	9.2	9.5	9.8	9.4	-	9.3

Table 7. Commercial Arctic charr and Atlantic salmon landings by stock unit, 1977-89, for the Nain Region of northern Labrador. Total also includes landings from subareas other than those within stock units.

Year	Voisey Unit		Nain Unit		Okak Unit		Total	
	Charr	Salmon	Charr	Salmon	Charr	Salmon	Charr	Salmon
1977	24108	209	76255	14943	42392	18468	186165	41581
1978	36991	462	73763	15216	76024	22177	213915	48945
1979	40590	327	66844	12658	43261	13126	175263	35722
1980	19694	120	75055	21134	49035	30050	167991	60332
1981	23810	104	65632	16665	47541	23121	231221	48124
1982	13309	139	55617	11737	34171	15383	203012	32974
1983	25593	701	51202	7480	48978	7589	149732	20105
1984	20873	193	38900	3177	18146	7166	123045	15596
1985	15648	333	41158	3819	33261	9210	107120	14653
1986	16655	109	37095	5371	28896	12828	99963	20090
1987	21242	191	45872	2979	19649	10770	97379	14414
1988	14037	157	38295	4813	17450	14607	74010	20090
1989	11019	146	51465	6034	16563	20855	84837	29960

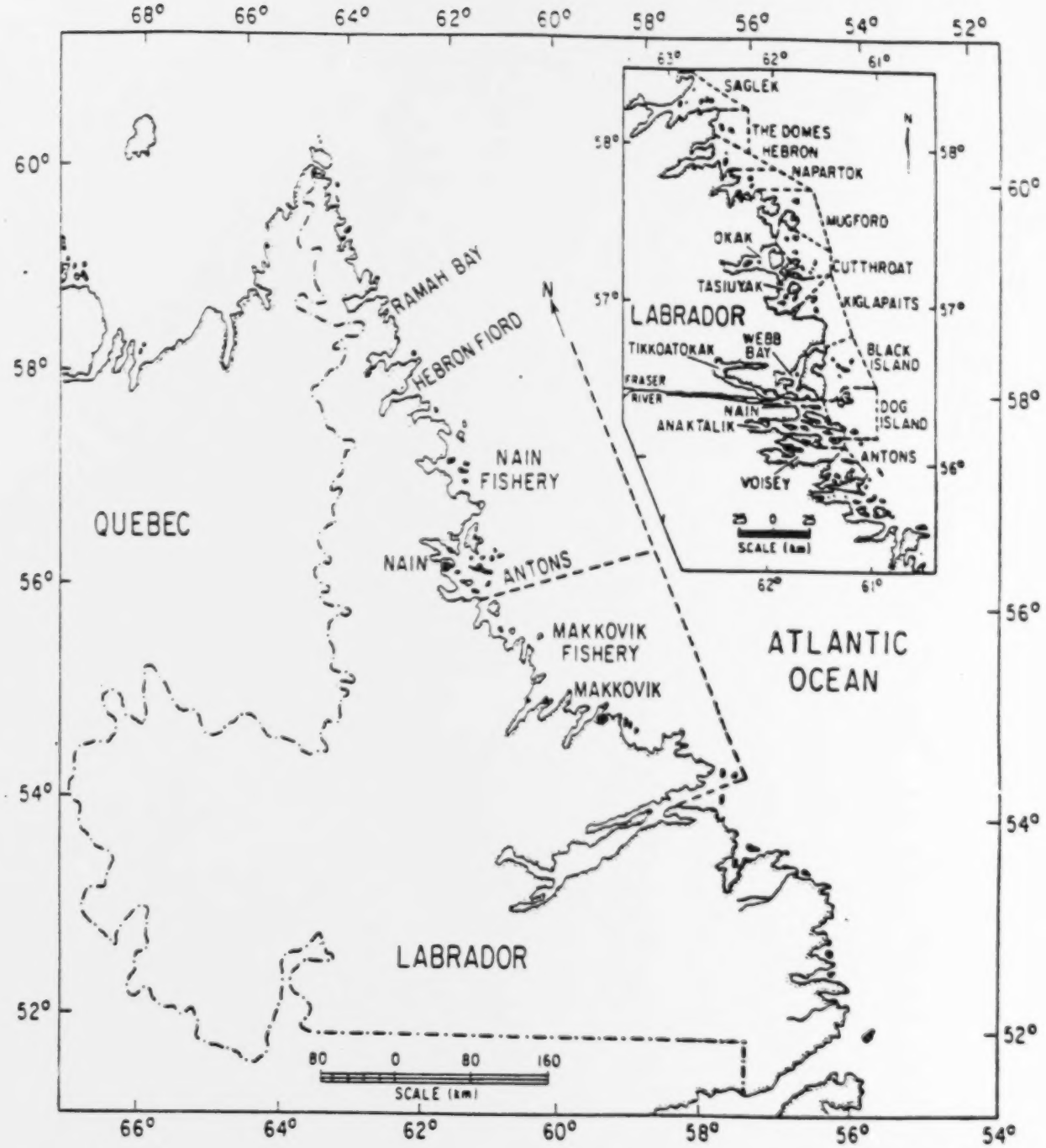

Fig. 1. Location of the Nain and Makkovik Fishing Regions in northern Labrador. Insert illustrates the location of subareas within the Nain Fishing Region.

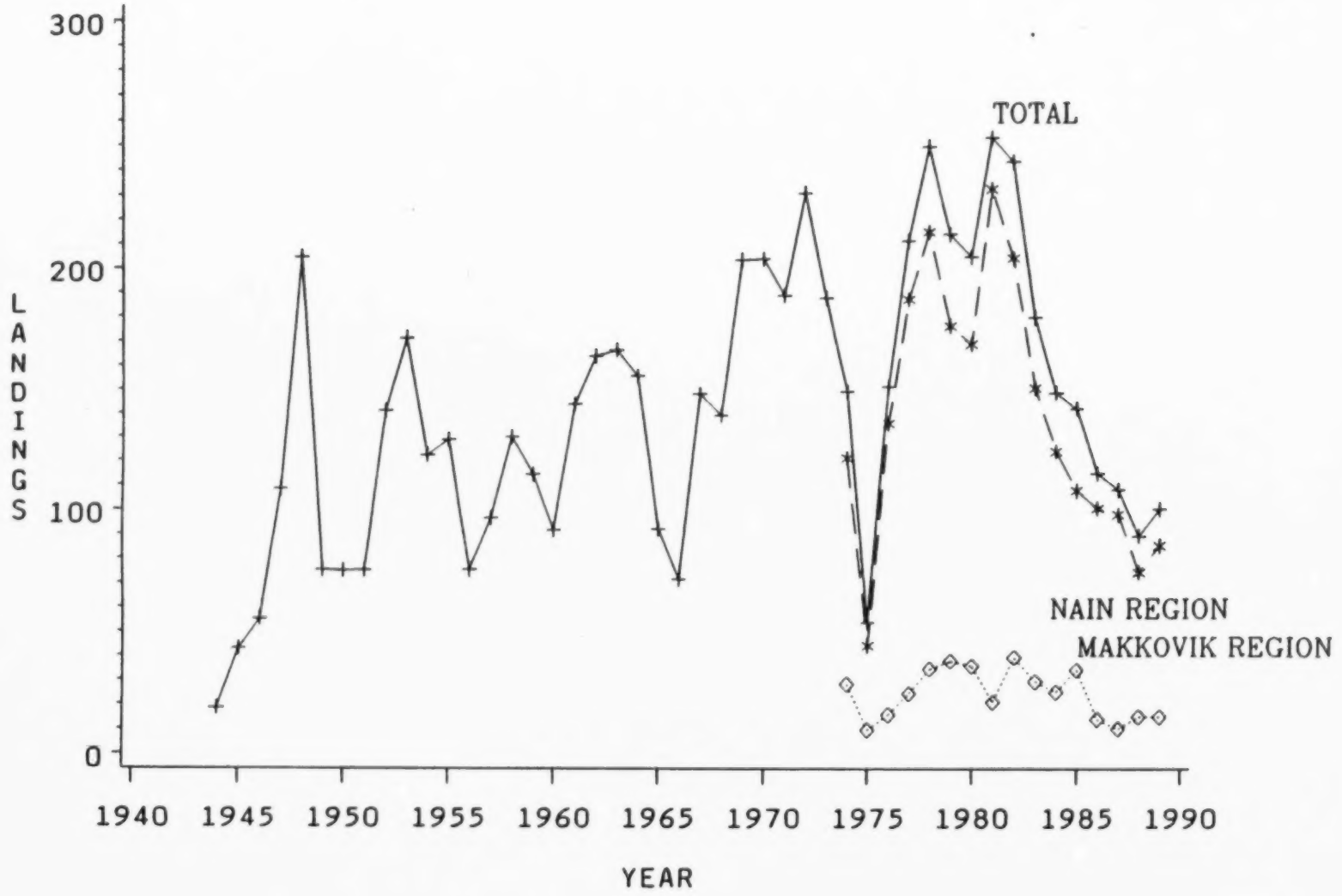

FIG. 2 SUMMARY OF NORTHERN LABRADOR ARCTIC CHARR LANDINGS (METRIC TONNES), 1944–1989

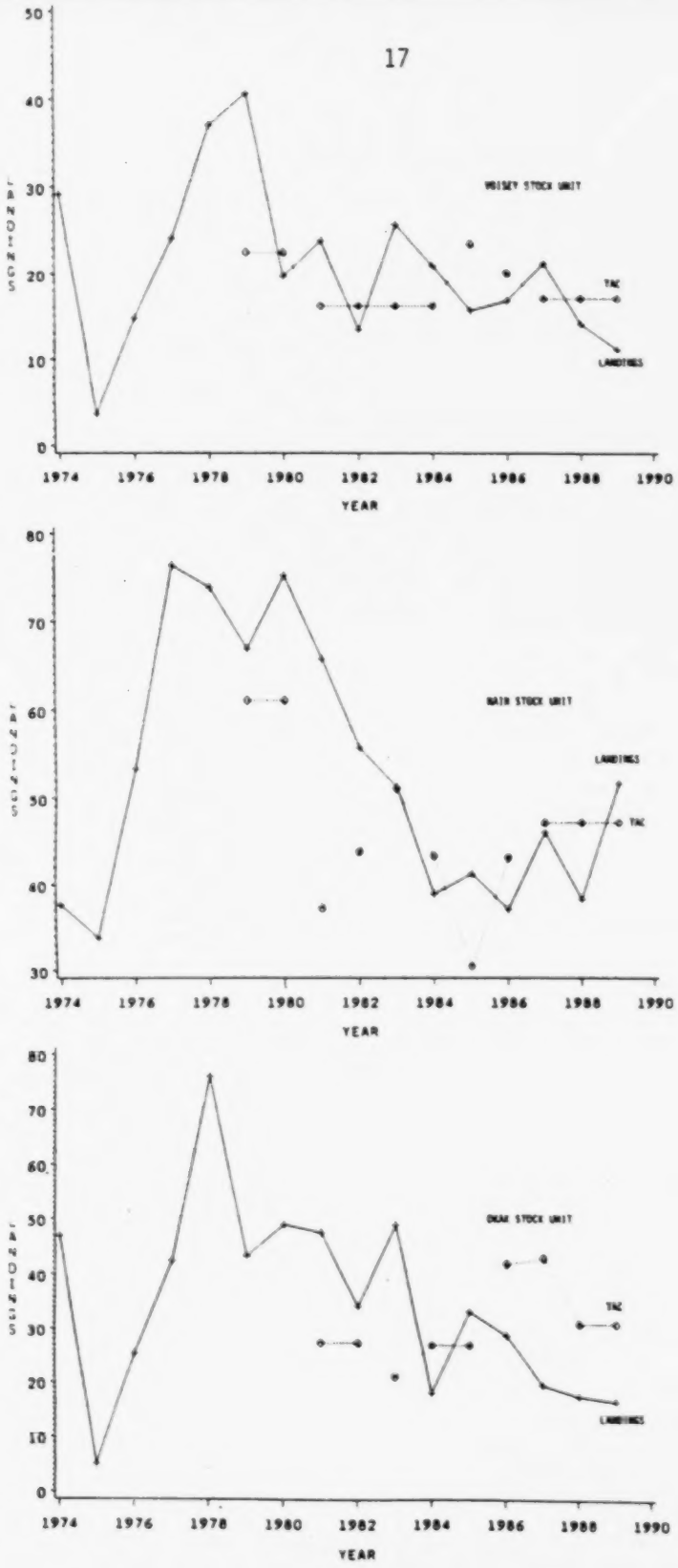

Fig. 3. Summary of total landings and total allowable catch for the Voisey, Nain, and Okak stock units.

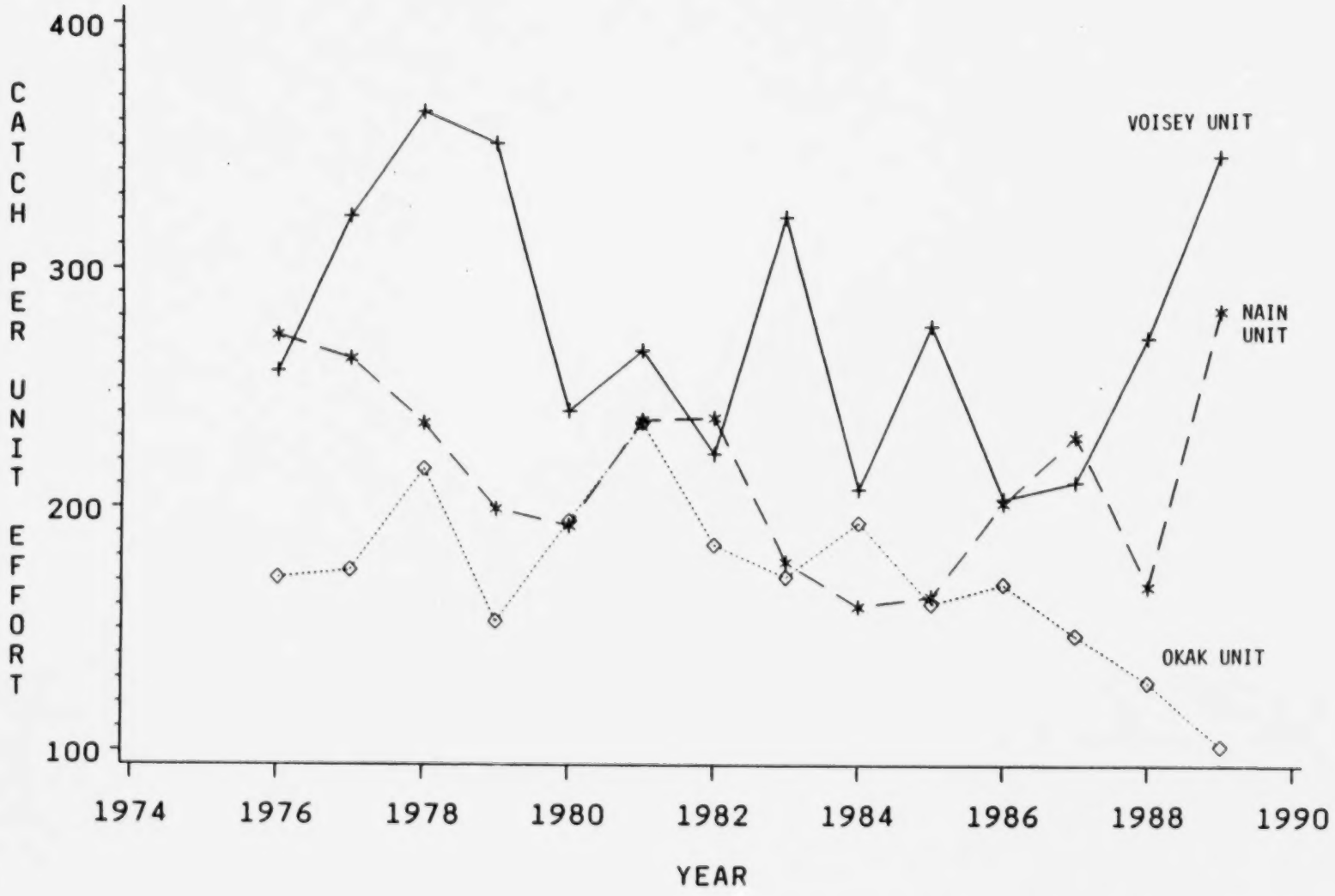

FIG. 4 TREND IN CATCH PER UNIT EFFORT (KG) OVER TIME FOR THE VOISEY, NAIN, AND OKAK STOCK UNITS

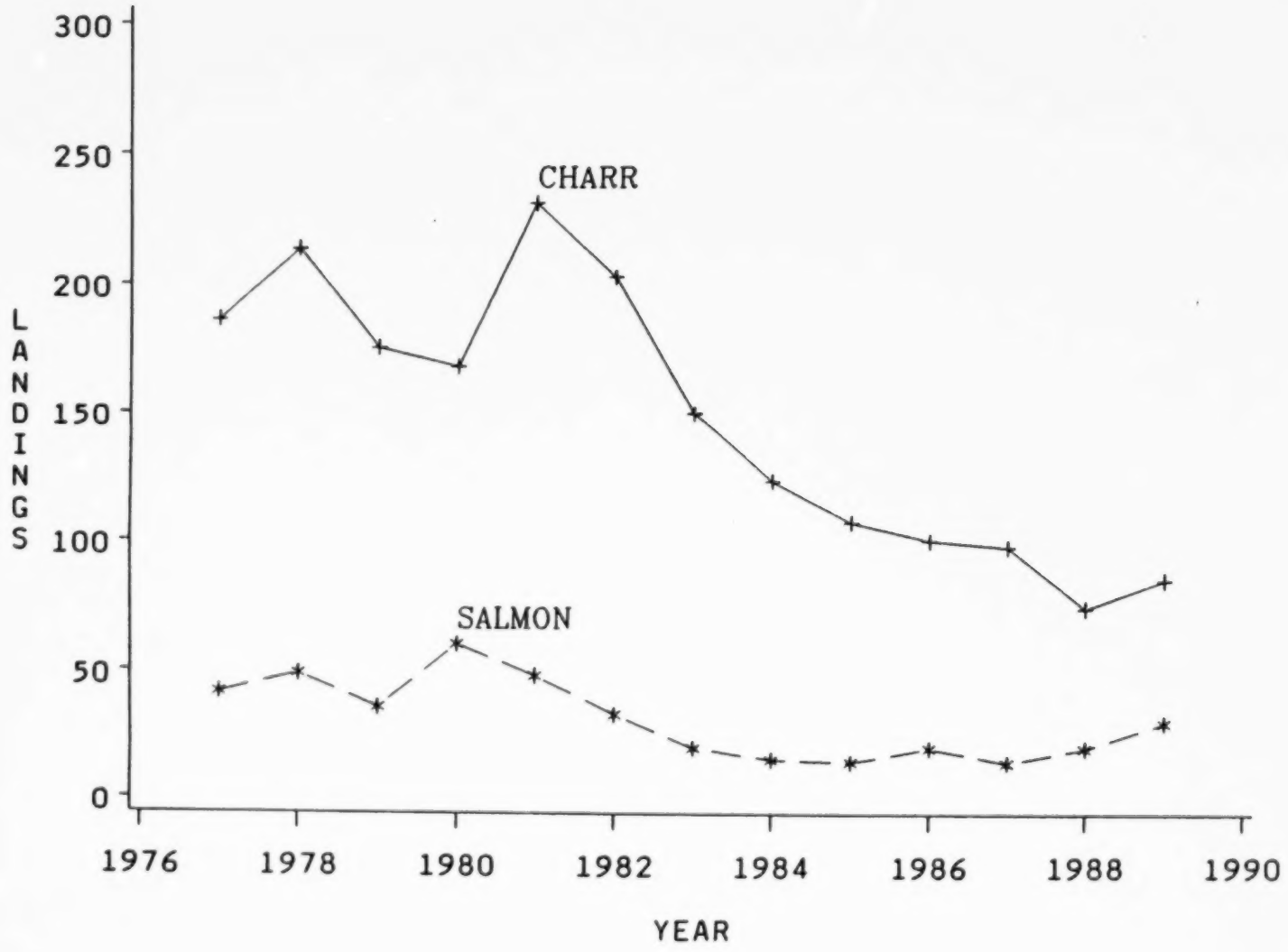

FIG. 5 SUMMARY OF NAIN REGION ARCTIC CHARR AND ATLANTIC SALMON LANDINGS (METRIC TONNES), 1977-1989

APPENDIX 1, ARCTIC CHARR CATCH STATISTICS, 1974-1989.
SUMMARY OF CATCH, EFFORT AND SIZE COMPOSITION

AREA=ANTONS

	1974	1975	1976	1977	1978	1979	1980	1981
QUOTAS								
CATCH (KG)	9135	3489	3172	2111	4011	19371	8460	7870
EFFORT (PERSON-WKS)	34	20	6	20	17	63	32	38
C/E (KG)	269	174	529	106	236	307	264	207
% > 2.3 KG			21	24	28	22	14	13

	1982	1983	1984	1985	1986	1987	1988	1989
QUOTAS								
CATCH (KG)	6191	23062	13099	14212	13589	8611	8460	11019
EFFORT (PERSON-WKS)	24	63	82	51	67	55	29	32
C/E (KG)	258	366	160	279	203	157	292	344
% > 2.3 KG	12	9	7					

AREA=VOISEY BAY

	1974	1975	1976	1977	1978	1979	1980	1981
QUOTAS						22500	22500	16100
CATCH (KG)	20045	238	12232	22488	33597	21880	11557	16325
EFFORT (PERSON-WKS)	64	2	45	56	85	59	52	53
C/E (KG)	313	119	272	402	395	371	222	308
% > 2.3 KG			42	35	34	32	17	16

	1982	1983	1984	1985	1986	1987	1988	1989
QUOTAS	16100	16000	16000	23400				
CATCH (KG)	7688	2953	8113	1435	3065	12630	5577	
EFFORT (PERSON-WKS)	38	17	24	6	22	54	26	
C/E (KG)	202	174	338	239	139	234	215	
% > 2.3 KG	17	17	16					
RIVER FISHERY (KG)								169

AREA=ANAKTALIK BAY

	1974	1975	1976	1977	1978	1979	1980	1981
QUOTAS						21500	21500	8660
CATCH (KG)	7821	2548	14670	21604	13075	14913	8045	9157
EFFORT (PERSON-WKS)	28	10	45	63	55	76	53	32
C/E (KG)	279	255	326	343	238	196	152	286
% > 2.3 KG			36	38	27	20	12	10

	1982	1983	1984	1985	1986	1987	1988	1989
QUOTAS	8660	11000	6100	8400		5000	5000	5000
CATCH (KG)	10836	2359	3980	7477	180	2002	1075	1175
EFFORT (PERSON-WKS)	27	24	34	39	7	18	12	13
C/E (KG)	401	98	117	192	26	111	90	90
% > 2.3 KG	11	11	12					

APPENDIX 1, ARCTIC CHARR CATCH STATISTICS, 1974-1989.
SUMMARY OF CATCH, EFFORT AND SIZE COMPOSITION

AREA=DOG ISLAND

	1974	1975	1976	1977	1978	1979	1980	1981
QUOTAS								
CATCH (KG)	2659	653	212	2039	386	1440	3048	1516
EFFORT (PERSON-WKS)	38	40	11	49	25	61	86	37
C/E (KG)	70	16	19	42	15	24	35	41
% > 2.3 KG			11	9	8	15	11	14

	1982	1983	1984	1985	1986	1987	1988	1989
QUOTAS								
CATCH (KG)	1105	6858	6666	6882	3289	16881	11735	2794
EFFORT (PERSON-WKS)	38	62	66	62	32	86	88	27
C/E (KG)	29	111	101	111	103	196	133	103
% > 2.3 KG	7	8	10					

AREA=NAIN BAY

	1974	1975	1976	1977	1978	1979	1980	1981
QUOTAS								
CATCH (KG)	12461		3119	8464				5450
EFFORT (PERSON-WKS)	37		10	28				29
C/E (KG)	337		312	302				188
% > 2.3 KG			16	15				4

	1982	1983	1984	1985	1986	1987	1988	1989
QUOTAS		5000						
CATCH (KG)	85	532	1886	2667	6437	3806	5179	20734
EFFORT (PERSON-WKS)	1	8	15	32	39	15	33	61
C/E (KG)	85	67	126	83	165	254	157	340
% > 2.3 KG		2	6					
RIVER FISHERY (KG)								345

AREA=TIKKOATOKAK BAY

	1974	1975	1976	1977	1978	1979	1980	1981
QUOTAS						39500	39500	28500
CATCH (KG)	9960	27695	31568	39483	55061	37919	42131	28066
EFFORT (PERSON-WKS)	28	76	81	94	147	108	130	80
C/E (KG)	356	364	390	420	374	351	324	351
% > 2.3 KG			19	20	18	14	10	5

	1982	1983	1984	1985	1986	1987	1988	1989
QUOTAS	35000	35000	26000	12500		16000	16000	16000
CATCH (KG)	28283	16211	8618	6243	3841	3608	2240	2636
EFFORT (PERSON-WKS)	75	65	43	24	16	12	12	13
C/E (KG)	377	249	200	260	240	301	187	203
% > 2.3 KG	7	8	5					
RIVER FISHERY (KG)								473

APPENDIX 1, ARCTIC CHARR CATCH STATISTICS, 1974-1989.
SUMMARY OF CATCH, EFFORT AND SIZE COMPOSITION

AREA=WEBB BAY

	1974	1975	1976	1977	1978	1979	1980	1981
QUOTAS								
CATCH (KG)	580	833	4550	2516	3472	3035	3008	8100
EFFORT (PERSON-WKS)	1	5	15	21	16	9	8	29
C/E (KG)	580	167	303	120	217	337	376	279
% > 2.3 KG			21	19	20	39	39	27

	1982	1983	1984	1985	1986	1987	1988	1989
QUOTAS						9000	9000	9000
CATCH (KG)	4607	15055	10476	5143	5890	8424	6041	5904
EFFORT (PERSON-WKS)	27	56	43	35	34	27	33	17
C/E (KG)	171	269	244	147	173	312	183	347
% > 2.3 KG	11	5	7					
RIVER FISHERY (KG)								146

AREA=BLACK ISLAND

	1974	1975	1976	1977	1978	1979	1980	1981
QUOTAS								
CATCH (KG)	4264	2101	2725	3389	2966	10632	20051	14413
EFFORT (PERSON-WKS)	60	62	48	65	81	92	130	94
C/E (KG)	71	34	57	52	37	116	154	153
% > 2.3 KG			8	10	14	7	6	7

	1982	1983	1984	1985	1986	1987	1988	1989
QUOTAS								
CATCH (KG)	11602	11028	7913	12750	17458	11151	12024	18222
EFFORT (PERSON-WKS)	79	87	62	68	72	50	61	60
C/E (KG)	147	127	128	188	242	223	197	304
% > 2.3 KG	8	4	5					

AREA=KIGLAPAITS

	1974	1975	1976	1977	1978	1979	1980	1981
QUOTAS								
CATCH (KG)	5131	1504	6089	5435	12097	17606	16543	21911
EFFORT (PERSON-WKS)	26	32	59	57	103	120	95	99
C/E (KG)	197	47	103	95	117	147	174	221
% > 2.3 KG			25	25	34	14	18	12

	1982	1983	1984	1985	1986	1987	1988	1989
QUOTAS								
CATCH (KG)	8326	20625	11431	6184	6983	1620	862	2065
EFFORT (PERSON-WKS)	34	103	55	41	55	14	9	22
C/E (KG)	245	200	208	151	127	116	96	118
% > 2.3 KG	16	12	9					

APPENDIX 1, ARCTIC CHARR CATCH STATISTICS, 1974-1989.
SUMMARY OF CATCH, EFFORT AND SIZE COMPOSITION

AREA=TASIUYAK

	1974	1975	1976	1977	1978	1979	1980	1981
QUOTAS								
CATCH (KG)	1467		281		2280	1837	1137	
EFFORT (PERSON-WKS)	15		2		9	11	8	
C/E (KG)	98		141		253	167	142	
% > 2.3 KG			21		71	34	14	
	1982	1983	1984	1985	1986	1987	1988	1989
QUOTAS								
CATCH (KG)	1060	1259	3423	4724	6749	8997	2823	3186
EFFORT (PERSON-WKS)	6	7	23	36	26	61	22	23
C/E (KG)	177	180	149	131	260	147	128	139
% > 2.3 KG	11	13	5					

AREA=MUGFORD

	1974	1975	1976	1977	1978	1979	1980	1981
QUOTAS								
CATCH (KG)			1970	1374	1148	170	513	
EFFORT (PERSON-WKS)			15	9	7	2	5	
C/E (KG)			131	153	164	85	103	
% > 2.3 KG			30	36	32	16	15	
	1982	1983	1984	1985	1986	1987	1988	1989
QUOTAS								
CATCH (KG)		15						
EFFORT (PERSON-WKS)		1						
C/E (KG)		15						
% > 2.3 KG								

AREA=OKAK BAY

	1974	1975	1976	1977	1978	1979	1980	1981
								27300
QUOTAS								11049
CATCH (KG)	34250	2354	17812	27592	36125	26171	17434	46
EFFORT (PERSON-WKS)	105	15	52	107	104	123	65	240
C/E (KG)	326	157	343	258	347	213	268	10
% > 2.3 KG			29	26	18	11	8	
	1982	1983	1984	1985	1986	1987	1988	1989
								26000
QUOTAS	27300	21000	27000	27000	27000	26000	22000	14973
CATCH (KG)	9031	30732	13864	24746	20141	15695	12608	84
EFFORT (PERSON-WKS)	26	147	30	119	91	71	51	178
C/E (KG)	347	209	462	208	221	221	247	
% > 2.3 KG	7	7	2					

APPENDIX 1, ARCTIC CHARR CATCH STATISTICS, 1974-1989.
SUMMARY OF CATCH, EFFORT AND SIZE COMPOSITION

AREA=CUTTHROAT

	1974	1975	1976	1977	1978	1979	1980	1981
QUOTAS								
CATCH (KG)	12641	2703	7526	15488	41146	17803	32397	37263
EFFORT (PERSON-WKS)	95	47	103	130	267	161	205	172
C/E (KG)	133	58	73	119	154	111	158	217
% > 2.3 KG			17	25	25	12	12	13

	1982	1983	1984	1985	1986	1987	1988	1989
QUOTAS								
CATCH (KG)	25699	19043	4570	8515	8756	3954	4842	1591
EFFORT (PERSON-WKS)	164	164	65	106	89	70	89	84
C/E (KG)	157	116	70	80	98	56	54	19
% > 2.3 KG	15	10	7					

AREA=NAPARTOK

	1974	1975	1976	1977	1978	1979	1980	1981
QUOTAS								
CATCH (KG)			28972	28039	8551	2486	752	291
EFFORT (PERSON-WKS)			124	126	50	33	11	3
C/E (KG)			234	223	171	75	68	97
% > 2.3 KG			14	22	20	16	13	12

	1982	1983	1984	1985	1986	1987	1988	1989
QUOTAS								
CATCH (KG)	16485							
EFFORT (PERSON-WKS)	60							
C/E (KG)	275							
% > 2.3 KG	8							

AREA=HEBRON FIORD

	1974	1975	1976	1977	1978	1979	1980	1981
QUOTAS								
CATCH (KG)				5957			2915	39901
EFFORT (PERSON-WKS)				37				106
C/E (KG)				161				376
% > 2.3 KG				16			19	34

	1982	1983	1984	1985	1986	1987	1988	1989
QUOTAS	29072		20000					
CATCH (KG)	37822		19531				543	
EFFORT (PERSON-WKS)	98		112				6	
C/E (KG)	386		174				91	
% > 2.3 KG	23							

APPENDIX 1, ARCTIC CHARR CATCH STATISTICS, 1974-1989.
SUMMARY OF CATCH, EFFORT AND SIZE COMPOSITION

AREA=DOMES

	1974	1975	1976	1977	1978	1979	1980	1981
QUOTAS								5187
CATCH (KG)								19
EFFORT (PERSON-WKS)								273
C/E (KG)								36
% > 2.3 KG								

	1982	1983	1984	1985	1986	1987	1988	1989
QUOTAS								
CATCH (KG)	2643		976					
EFFORT (PERSON-WKS)	14		10					
C/E (KG)	189		98					
% > 2.3 KG	17							

AREA=SAGLEK FIORD

	1974	1975	1976	1977	1978	1979	1980	1981
QUOTAS								24722
CATCH (KG)								77
EFFORT (PERSON-WKS)								321
C/E (KG)								18
% > 2.3 KG								

	1982	1983	1984	1985	1986	1987	1988	1989
QUOTAS								
CATCH (KG)	23791		5389					
EFFORT (PERSON-WKS)	118		40					
C/E (KG)	202		135					
% > 2.3 KG	7							

AREA=RAMAH

	1974	1975	1976	1977	1978	1979	1980	1981
QUOTAS								
CATCH (KG)								
EFFORT (PERSON-WKS)								
C/E (KG)								
% > 2.3 KG								

	1982	1983	1984	1985	1986	1987	1988	1989
QUOTAS								
CATCH (KG)	7758		3110					
EFFORT (PERSON-WKS)	26		25					
C/E (KG)	298		124					
% > 2.3 KG	20							

APPENDIX 1, ARCTIC CHARR CATCH STATISTICS, 1974-1989.
SUMMARY OF CATCH, EFFORT AND SIZE COMPOSITION

AREA=NACHVAK

	1974	1975	1976	1977	1978	1979	1980	1981
QUOTAS								
CATCH (KG)								
EFFORT (PERSON-WKS)								
C/E (KG)								
% > 2.3 KG								

	1982	1983	1984	1985	1986	1987	1988	1989
QUOTAS				6142	1808			
CATCH (KG)				18	4			
EFFORT (PERSON-WKS)				341	452			
C/E (KG)								
% > 2.3 KG					1777			

TRAP NET FISHERY

AREA=MAIN FISHERY

	1974	1975	1976	1977*	1978	1979	1980	1981
QUOTAS								
CATCH (KG)	120414	44118	134898	186165	213915	175263	167991	231221
EFFORT (PERSON-WKS)	531	309	616	863	966	918	880	914
C/E (KG)	227	143	219	216	221	191	191	253
% > 2.3 KG			24	25	25	17	12	16

	1982	1983	1984	1985	1986**	1987	1988	1989
QUOTAS								
CATCH (KG)	203012	149732	123045	107120	99963	97379	74010	84837
EFFORT (PERSON-WKS)	856	804	729	637	554	533	471	436
C/E (KG)	237	186	169	168	180	183	157	195
% > 2.3 KG	13	8	6					
								1133

RIVER FISHERY

* INCLUDES 186 KG UNACCOUNTED FOR BY AREA
** TOTAL ALSO INCLUDES TRAP NET CATCH FROM NACHVAK FIORD

APPENDIX 2. MAIN REGION ATLANTIC SALMON CATCH STATISTICS, 1977-1989.

AREA=NAIN BAY

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
CATCH (KG)					90		2	2	9	43		7	118
EFFORT (PERSON-WKS)					9		1	1	2	6		1	11
C/E (KG)					10		2	2	5	7		7	11

AREA=DOG ISLAND

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
CATCH (KG)	5999	5337	6877	9220	8022	4476	3931	618	772	473	965	703	1106
EFFORT (PERSON-WKS)	76	66	101	110	78	62	70	32	21	20	36	36	23
C/E (KG)	79	81	68	84	103	72	56	19	37	24	27	20	48

AREA=BLACK ISLAND

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
CATCH (KG)	8659	9710	5557	11844	8374	6944	2940	2394	2842	4790	1928	3980	4686
EFFORT (PERSON-WKS)	98	103	116	139	99	96	78	55	67	86	54	57	64
C/E (KG)	88	94	48	85	85	72	38	44	42	56	36	70	73

AREA=OKAK BAY

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
CATCH (KG)	842	1011	1055	335	1364	92	653	153	465	428	171	283	775
EFFORT (PERSON-WKS)	51	51	66	36	34	11	75	19	52	44	29	30	64
C/E (KG)	17	20	16	9	40	8	9	8	9	10	6	9	12

AREA=NAPARTOK

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
CATCH (KG)	2174	3423	4402	929	193	432							
EFFORT (PERSON-WKS)	72	32	33	8	3	33							
C/E (KG)	30	107	133	116	64	13							

AREA=HEBRON FIORD

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
CATCH (KG)	430				334	350		2242					
EFFORT (PERSON-WKS)	31				33	24		70					
C/E (KG)	14				10	15		32					

APPENDIX 2. MAIN REGION ATLANTIC SALMON CATCH STATISTICS, 1974-1989.

AREA=WEBB BAY

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
CATCH (KG)	236	131	118	2	173	264	487	142	173	59	79	103	114
EFFORT (PERSON-WKS)	17	9	6	1	19	20	42	17	15	12	9	10	12
C/E (KG)	14	15	20	2	9	13	12	8	12	5	9	10	10

AREA=KIGLAPAITS

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
CATCH (KG)	5357	7544	5183	7690	5177	3743	4231	2502	1255	1459	336	346	2430
EFFORT (PERSON-WKS)	47	86	117	94	94	35	90	39	38	48	14	6	24
C/E (KG)	114	88	44	82	55	107	47	64	33	30	24	58	101

AREA=TASIUYAK

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
CATCH (KG)		3	18	248			105	58	35	324	138	167	495
EFFORT (PERSON-WKS)		1	2	5			2	7	6	15	19	9	12
C/E (KG)		3	9	50			53	8	6	22	7	19	41

AREA=CUTTHROAT

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
CATCH (KG)	17626	21166	12072	29716	21757	15291	6936	7013	8745	12400	10599	14323	20080
EFFORT (PERSON-WKS)	135	174	153	199	165	157	122	50	82	101	87	108	126
C/E (KG)	131	122	79	149	132	97	57	140	107	123	122	133	159

AREA=MUGFORD

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
CATCH (KG)		121	8	159									
EFFORT (PERSON-WKS)		7	2	3									
C/E (KG)		17	4	53									

AREA=DOMES

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
CATCH (KG)					2033	1107		164					
EFFORT (PERSON-WKS)					16	14		9					
C/E (KG)					127	79		18					

APPENDIX 2, MAIN REGION ATLANTIC SALMON CATCH STATISTICS, 1974-1989.

AREA=SAGLEK FIORD

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
CATCH (KG)					498	78		67					
EFFORT (PERSON-WKS)					26	11		9					
C/E (KG)					19	7		7					

AREA=ANTONS

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
CATCH (KG)	126	51	293	85	59	88	638	139	333	104	182	148	146
EFFORT (PERSON-WKS)	10	7	34	10	12	10	40	18	19	16	23	19	20
C/E (KG)	13	7	9	9	5	9	16	8	18	7	8	8	7

AREA=NACHVAK

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
CATCH (KG)													
EFFORT (PERSON-WKS)													
C/E (KG)													

AREA=VOISEY BAY

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
CATCH (KG)	83	410	33	35	45	51	62	55		5	10	10	
EFFORT (PERSON-WKS)	14	20	5	7	9	9	9	5		1	2	2	
C/E (KG)	6	21	7	5	5	6	7	11		5	5	5	

AREA=ANAKTALIK BAY

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
CATCH (KG)	27	12	92	11			14	9	5				
EFFORT (PERSON-WKS)	4	3	12	3			2	2	2				
C/E (KG)	7	4	8	4			7	5	3				

AREA=TIKKOATOKAK BAY

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
CATCH (KG)	22	25	13	57	6	53	105	12	18	5	7	20	10
EFFORT (PERSON-WKS)	5	3	3	4	1	8	11	3	4	1	2	4	3
C/E (KG)	4	8	4	14	6	7	10	4	5	5	4	5	3

APPENDIX 2. NAIN REGION ATLANTIC SALMON CATCH STATISTICS, 1974-1989.

AREA=RAMAH

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
CATCH (KG)						5		27					
EFFORT (PERSON-WKS)						1		3					
C/E (KG)						5		9					

AREA=NAIN FISHERY

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
CATCH (KG)	41581	48945	35722	60332	48124	32974	20105	15596	14653	20090	14414	20090	29960
EFFORT (PERSON-WKS)	560	562	650	619	598	491	542	339	308	350	275	282	359
C/E (KG)	74	87	55	97	80	67	37	46	48	57	52	71	83